



The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER, MARCH 2005

The next meeting of the Pretoria Centre will take place at Christian Brothers College, Pretoria Road, Silverton, Pretoria

Date and time Wednesday 23 March at 19h15
Chairperson Michael Poll
Beginner's Corner Lunar Facts and Fables by Lorna Higgs
What's Up by Johan Smit

+++++++ LEG BREAK - Library open ++++++

Main Topic : The Titan Landing by Neville Young & Mike Haslam

The meeting will be followed by tea/coffee and biscuits as usual.

The next social/practical evening will be held on Friday 18 March at the Pretoria Centre Observatory, which is also situated at CBC. Arrive anytime from 18h30 onwards.

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Last month's Meeting - by Mike Haslam

A large number of members and visitors attended our February meeting. After the last meeting in the biology lab, to be back in the auditorium was, despite the hard seats, a pleasure.

We started off as usual with announcements and then Andrie van der Linde was invited to present "Beginner's Corner". Andrie talked to us about a new imaging device from Celestron which fits the standard 1.25" eyepiece holder of a telescope and comes complete with software for your computer. It seems to operate fairly simply and is designed for brighter solar system objects.

Andrie's pictures looked pretty good and I noticed several of our members looking at them with interest. Who knows, maybe this is the way to go. With a computer controlled telescope and imaging system you no longer have to brave the cold or the mosquitoes. Sit

inside and take pictures in comfort. No, for me, there is still the thrill of really seeing things with your own eye.

Wayne Mitchell presented "What's up" with his usual verve, keeping us all interested and extolling us to come along to the practical evening where there is plenty to see, to do and to learn about.

The main talk was given by the indomitable Claire Flanagan of the Johannesburg Planetarium. If you knew nothing about pulsars or the Square Kilometer Array at the start, you certainly did by the end. Claire has a special way of getting things across and in the light of our auditorium, is much more interesting to watch than in the darkness of the planetarium!

A thank you to all our speakers and to everyone who attended. See you next month.

Last month's observing evening

by Michael Poll, Johann Smit & Neville Young

At last! An observing evening with clear skies, and more than 30 people were present. The moon was the first thing we looked at, the crater Copernicus was well placed. Saturn was next, the rings are still quite wide open. Two moons were easily seen, some people saw three.

The Pleiades (M45) were quite low in the north, but still a great sight. The "Southern Pleiades" (IC2602) - the cluster of stars around Theta Carinae were at about the same altitude, but at the opposite end of the sky. Also in Carina, the open cluster NGC 2516 near epsilon Carinae was observed. Some other clusters in this region were also chanced upon, but identification was not possible because the signpost stars were washed out by moonlight.

We had a look at Alpha Crucis the brightest star in the Southern Cross. It is a wide double with a fainter magnitude 5 star nearby, but the bright star itself is seen as two almost equal, but very close, blue-white components. Although low in the sky, we saw the ever-popular Jewel Box (NGC4755), and Alpha Centauri.

Jan Plomp had been brought to his knees by his tripod mounted binoculars. They were aimed at the helmet area of Orion, and in the view was a geostationary satellite which blinked briefly every 48 seconds as its rotation reflected the sunlight to Earth off a bright panel. Jan has seen this satellite before and has watched it stay at the same azimuth, but move northwards or southwards in altitude. This raised quite some discussion between Jan, Neville, Casper and Andrie as to the difference between geosynchronous and geostationary satellites.

The 12 inch telescope could not access Saturn, as the planet was obscured by a tree on the northern side of the dome. Instead we concentrated on the Great Nebula in Orion. Despite the relatively bright moon, the four stars of the trapezium were clearly visible, as was a slight green tint in the nebulosity. We then looked at the moon. It was a spectacular sight that did not do the viewer's dark adaptation any good, but they were still very impressed.

Lastly we tried Jupiter, but due to low clouds on the horizon the viewing was not good. Jupiter will be more accessible for viewing this month.

Digital imaging

Andrie van der Linde - Pretoria Centre Member - introduced himself to the attendees at the February meeting by way of a brief talk on digital imaging. At the same meeting, Neville Young took delivery of a NexImager - a CCD telescope camera. Mike Haslam and Neville are familiarising themselves with it using Mike's 10" telescope and the image of Saturn, shown below, is a very early attempt. As they get to know the optimisation controls, they should get some super images.

Andrie has the following offer for you. Contact him at: 083 632 4894 (cell) or at email address:

eridanusoptics@yahoo.com

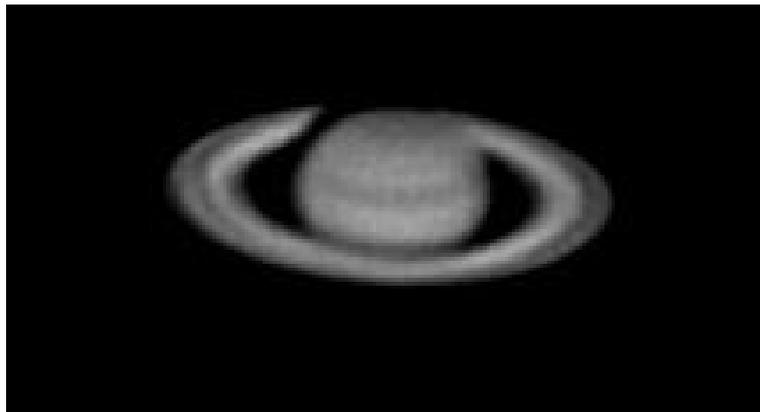
Eyepiece special offer:

Eridanus Optics negotiated a special eyepiece deal with a supplier. A significant saving is realized by supplying the eyepieces in kit form.

To order your eyepieces, the following will apply:

- 60% Deposit when ordering
- 40% Payment upon delivery
- Subject to exchange rate variation (Price Based on \$1 = R6.00)

- Orders open until mid April 2005
- Expected delivery: June 2005
- Inspection sets of 1¼" sets available
- Set 1 (1¼"): R600
 - * 15mm Plössl eyepiece
 - * 2x Barlow
 - * Moon filter (neutral density)
 - * Carry case
- Set 2 (1¼"): R1060
 - * 32mm, 15mm and 9mm Plössl eyepieces
 - * 2x Barlow
 - * 3x Color filters
 - * Moon filter (neutral density)
 - * Carry case
- 2" Set: R1800
 - * 52mm and 32mm Plössl eyepieces
 - * 1¼" 15mm (65° FOV) eyepiece
 - * Carry case
 - * One of the following:
 - 2" diagonal for SCT
 - 2" diagonal for non SCT's
 - 2" 42mm Plössl eyepiece



The Brightest Stars - Past And Future — by Michael Poll

2. The Brightest Stars

When we look at the sky we see the *apparent* brightness of the stars. The apparent brightness is a function of both the intrinsic, or actual brightness, and the distance. Stars move independently through space, so their apparent brightnesses change over long periods of time as they move towards or away from us.

Four parameters are required to calculate the past or future brightness of a star. These are:-

- its radial velocity i.e its motion along the line of sight, which indicates whether it is moving towards us or away from us.
- its proper motion, which is its angular motion across the sky (the stars do not move *directly* towards or away from us, but across our line of sight).
- its present apparent brightness.
- its present distance.

These parameters can be measured directly, but the greatest uncertainty is the distance. The Hipparcos satellite (*High Precision Parallax Collecting Satellite*) was designed to address the distance problem. A catalogue of extremely accurate distances and the proper motions of 118 218 stars was published in the Hipparcos Catalogue in 1997. These distance measurements are the most accurate yet, but there is still an element of uncertainty in the results for more distant stars, because the angles measured are very small. Hipparcos measured the distances of 400 stars with 1% precision, (only a few dozen had previously been measured

with this degree of accuracy), and it measured the distances of more than 7000 stars with a precision of 5% (previously only about 100 had been done). Accurate distances are now available to within about 500 light years of the sun. However, the further away the star, the greater the uncertainty in the distance - for a star 1000 light years away, the uncertainty is about 30%. Although Hipparcos did not measure radial velocities, nearly 20 000 of the stars in the catalogue have had this parameter measured elsewhere.

The five brightest stars in the night sky (at present!) are

- **Sirius** : visual magnitude -1.44, distance 8.6 light years.
- **Canopus**: visual magnitude -0.62, distance 313 light years.
- **Alpha Centauri**: visual magnitude -0.28, distance 4.4 light years.
- **Arcturus**: visual magnitude -0.05, distance 36.7 light years.
- **Vega**: visual magnitude -0.03, distance 25.3 light years.

Five million years ago the brightest star was Epsilon Canis Majoris, which was then only 34 light years away and was at magnitude -3.99 at its brightest. It is now 431 light years away and magnitude +1.5 . Epsilon was followed by Beta Canis Majoris, which became as bright as magnitude -3.65. At that time it was only 37 light years away, but it is now 500 light years away and magnitude 1.98.

After these, Canopus became the

brightest star, a position it has held three times, and will hold once more in the future. It first became the brightest star 3 700 000 years ago and was at peak brightness 600 000 years after that, when it was 177 light years away and at magnitude -1.86.

These three stars were followed by Zeta Sagittarii and Zeta Leporis, which reached magnitude -2.74 and -2.05 respectively. They were 8 and 5.3 light years away when at their brightest. Currently they are 89 and 70 light years away, and are both below magnitude 2.5.

950 000 years ago, Canopus again became the brightest star, even though it was now 252 light years away and at magnitude -1.1. Canopus was followed by Aldebaran, which peaked 320 000 years ago when it was magnitude -1.54 and 21.5 light years away. It is now 65 light years away.

Capella followed Aldebaran. 250 000 years ago Capella was 28 light years away and at magnitude -0.82. It is now 42 light years away and magnitude 0.1. After Capella, Canopus became the brightest star again, at magnitude -0.7, distance 301 light years.

Sirius became the brightest star 90 000 years ago, and will be the brightest star in the sky for the next 210 000 years. It will be at peak brightness in 60 000 years time when it will be 7.8 light years away and at magnitude -1.64. Thereafter, Vega will be the brightest star for 470 000 years. It will be at its brightest 80 000 years after becoming

the brightest star, when it will be 17.2 light years away, and at magnitude -0.8. After Vega, Canopus is again the brightest star for about half a million years, although at the beginning of this period, it will be magnitude -0.4 and 346 light years away.

It is interesting to note that the brightest stars of the past are brighter than the brightest stars of the future will be. Although there is some uncertainty in their current distances, making the retrospective magnitude estimates in error to within a magnitude or so, Epsilon Canis Majoris and Beta Canis Majoris were both nearly as bright as Venus, and no "brightest star" has been as bright since. Zeta Sagittarii and Zeta Leporis were about as bright as Jupiter, but Sirius is the brightest star since all these, and none will surpass it for at least 5 000 000 years.

The figures also show how great the intrinsic brightness of Canopus is. All the other stars that achieved "brightest" status did so because they came so close - all came within 40 light years, and mostly within 30, but the closest Canopus came was 177 light years.

References

From Hipparchus to Hipparchos by Catherine Turon, Sky & Telescope, July 1997, p28.

Once and Future Celestial Kings by Jocelyn Tomkin, Sky & Telescope, April 1998, p59.



Foto geneem deur Koos van Zyl met sy Canon 300D. Ses foto's van 4 minute elk digitaal saamgesit. Die objekte is NGC 253 (galaxy) en NGC 288 (Globular Cluster). Geneem deur 'n 400mm f/5 refraktor.

Query

A query received on our website from Craig Lyall-Watson. (lyall.c@doe.gov.za) I have recently acquired an ETX-90ec telescope and was wondering if you know of anyone else who is currently using one of these. There are a few problems with which I would like some assistance. Thanks in advance.

Sterrewag te koop

Ek wil my sterrewag verkoop. Prys: R1700. Foto's beskikbaar.
Kontak Dewald van Vuuren by: Tel. 012 674 1013, Fax. 012 664 2729
Sel 082 726 8903
E-pos Dewald.JVVuuren@kumbaresources.com

Astronomical website addresses

Star clusters: <http://www.seds.org/messier/cluster.html>
Globular clusters: <http://www.seds.org/messier/glob.html>
NGC5139 (Omega Centauri):
<http://www.seds.org/messier/xtra/ngc/n5139.html>
<http://www.phy.ncku.edu.tw/~astrolab/mirrors/apod/ap961004.html>

Stargazing weekend of the Pretoria Centre of the ASSA

Let's get away from the city lights and under the Milky Way...

- **WHERE?** NYLSVLEY NATURE RESERVE, near Naboomspruit, about 160 km north of Pretoria.
- **WHEN?** Friday to Sunday, 6th – 8th May 2005

Nylsvley nature reserve is an ideal dark sky site for keen observers. For bird-lovers, there are also 365 recorded bird species, 5 bird-viewing hides and other game for daytime leisure.

Dormitories: 2 units, each consisting of 7 rooms with 2 single beds. Mattresses only. **Please bring own bedding.** Most rooms have a mains plug. Units include separate communal men and ladies toilet + bathroom, 1 bathtub and 2 showers. **Note!** Dormitories are not luxurious, more like a veld school setup, but still pleasant and very peaceful.

Cooking Facility: One large kitchen. 2 ovens, 2 fridges and 1 freezer. 2 sinks for dishwashing. **Bring own pots, plates, knives and forks.** There is a braai place available adjacent to a lapa and a few chairs, **however I recommend you bring at least 1 fold-up chair. Bring your own wood or charcoal.**

Costs: R120.00 per person for the weekend, non refundable. Children under 12 years free.

Admission to the reserve: Car - R20, Combi - R30, Adults - R10, Children - R5.

No shop on premises. Closest town, Naboomspruit 10km. NB! Borehole water only. Advisable to bring your own drinking water.

Directions: From Pretoria, head north on the N1. Take Nylstroom off-ramp at Kranskop toll plaza. At Nylstroom turn right onto R101 (Thabo Mbeki road) towards Potgietersrus and Naboomspruit. Drive towards Naboomspruit, mountains on your left. Turn right at Boekenhout sign, onto gravel road, over railway line. Carry on straight for 8 km. Nylsvley is on your left.

Kindly deposit the money into the following account and fax a copy of your deposit slip, with your telephone number to Wayne Mitchell at: 012 719 9068 (w).

Account holder: **ASSA Pretoria Centre**
Bank: **ABSA Rosebank**
Branch code: **630805**
Account Number: **4058335681**

Note: Please specify your full name as a reference for the deposit.

First come, first serve, so book soon! To prevent double bookings, please confirm your booking by contacting me, Wayne Mitchell and do not book with Nylsvley.

For more info:

Wayne Mitchell: 072 465 7739 (c)
012 719 9065 (w)

Zodiacal Constellation Mnemonic Competition

A Mnemonic is a device, such as a formula or rhyme, used as an aid in remembering. I (Neville) needed one to help me remember the order of the zodiacal constellations so that navigating around the night sky is made a little easier. I have heard several cute mnemonics which help folk remember the order of the planets, but I have never needed them, being very familiar with them.

The constellation mnemonic starts with Aries which is at zero hour Right Ascension and continues in increasing RA - that is towards the East. Remember that new constellations appearing above the eastern horizon have increasing RA values (except of course when wrapping around again to zero).

By writing the best Zodiacal Constellation Mnemonic, you will win an LED headlamp. These headlamps can switch between two hi-brite white LEDs or a single hi-brite red LED. Three AAA batteries will power it for up to 50 hours and it straps easily and lightly around your head making movement in the dark less cumbersome.



- Submit your mnemonic to me before the end of the June monthly meeting on 23rd June.
- This competition is only open to members of the Pretoria Society.
- The committee will be the judges, so they are not eligible to enter.
- The competition will be voided if we receive less than 8 entries, so please do encourage your friends to compete.
- The winner will be announced at the AGM in July where the prize will be presented.

The constellations are Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Capricorn, Aquarius, Pisces. My suggested Mnemonic is: A T elescope Grows Cold Lying Very Lonely Stored Somewhere Closed Awayfrom Pupils. I am sure someone can improve on that.

PRETORIA CENTRE COMMITTEE

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